

Environment Canada Imaging Cover Page

Report N.:



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THE DIURNAL VARIATION OF PRECIPITATION  
FREQUENCY AT TORONTO

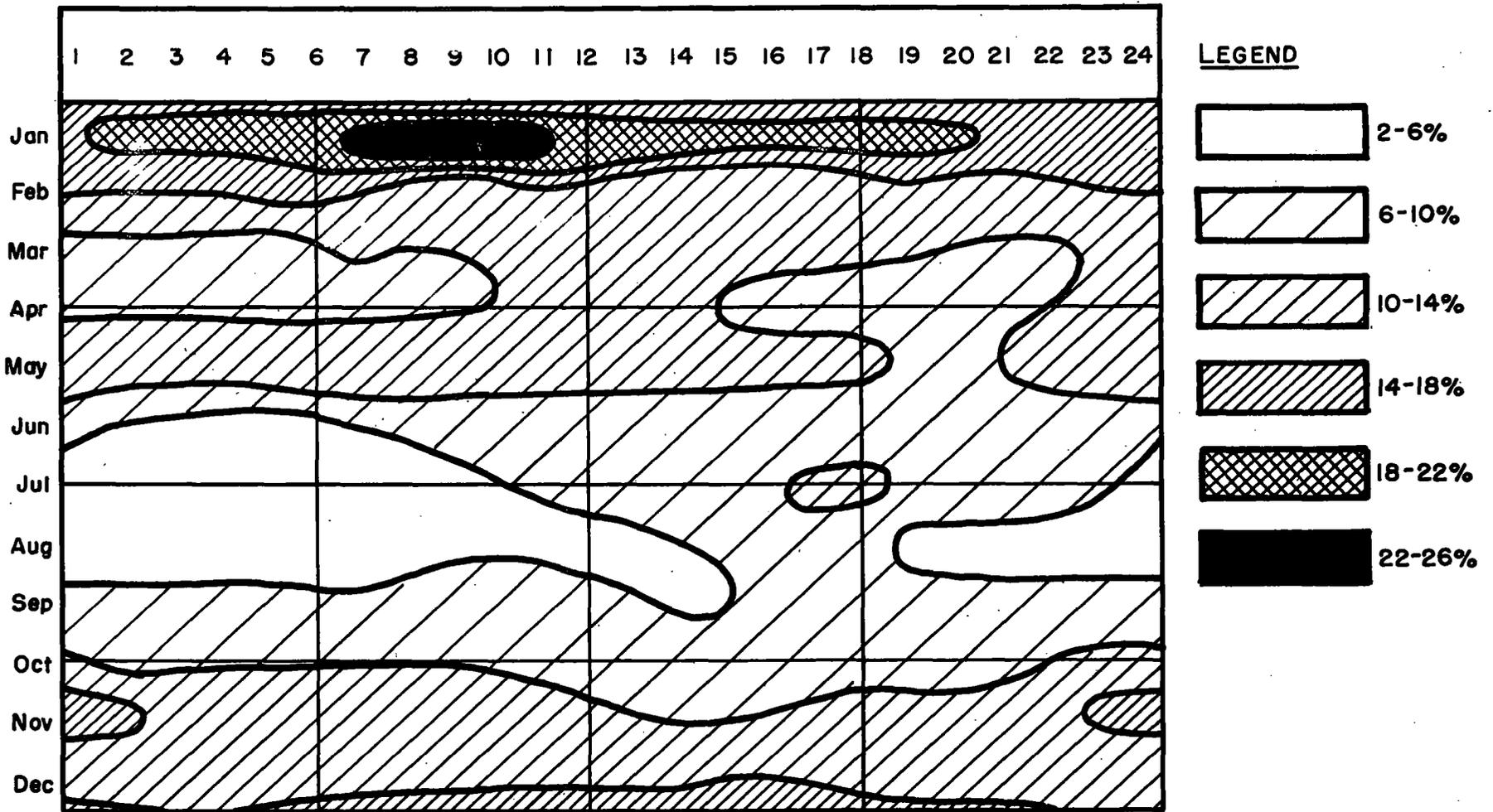
by  
M.K. THOMAS

1. The attached charts result from some unpublished work carried out several years ago on the diurnal variation of precipitation frequency at Toronto. The attached charts show the diurnal variation of - (a) measurable precipitation; (b) all precipitation including traces; (c) measurable snow, and (d) thunderstorms.
2. The data used in this study were from Toronto Malton Airport over the 10-year period from 1941 to 1950. The exact hours, (i.e. 0100, 0200, etc.), were used as reference points. If the precipitation began at 1320 hours and ended at 1350 hours, the hour ending at 1400 hours was credited with one occurrence. If, however, the precipitation did not stop until 1450 hours, both the hours ending at 1400 and 1500 were credited. To avoid counting trivial cases when the major precipitation period was in an adjacent hour, any time plus or minus five minutes from the hour, was omitted. Thus a precipitation period beginning at 1455 hours and ending at 1535 hours was credited only to the hour ending at 1600 hours.
3. As a working rule the precipitation amounts had to be at least 0.01 inch per hour before the precipitation was classed as measurable. With snowfall the criterion was 0.1 inch per hour. In noting thunderstorm occurrences, the official definition of a thunderstorm (i.e. the hearing of thunder at the station) was followed.
4. In order to smooth out the hourly frequency totals after they have been summed and meaned, a simple smoothing formula was used, and finally the smooth frequencies for each hour were divided by total possible frequency and the result multiplied by 100%.
5. Diurnal frequency of measurable precipitation - In winter the greatest frequency is in the morning hours, with the maximum percentage frequency of 22% occurring between 0700 and 1100 hours in January. In spring there is small variation from hour to hour throughout the day. By mid summer there is a sharply pronounced maximum which occurs in the late afternoon. In the fall and early winter there is once again little diurnal variation.
6. Diurnal variation of all precipitation - Since traces of precipitation are included, the winter months show an increased frequency over the preceding chart. The times of marked periods of maxima and minima are, however, almost the same. These two charts illustrate the fact that at Toronto, January and July show the extreme conditions for the winter and summer seasons respectively.
7. Diurnal variation of measurable snow - In January the diurnal variation of measurable snowfall is much the same as that for measurable precipitation with a maximum at 0900 - 1000 hours. In late fall and early spring there is little diurnal variation.

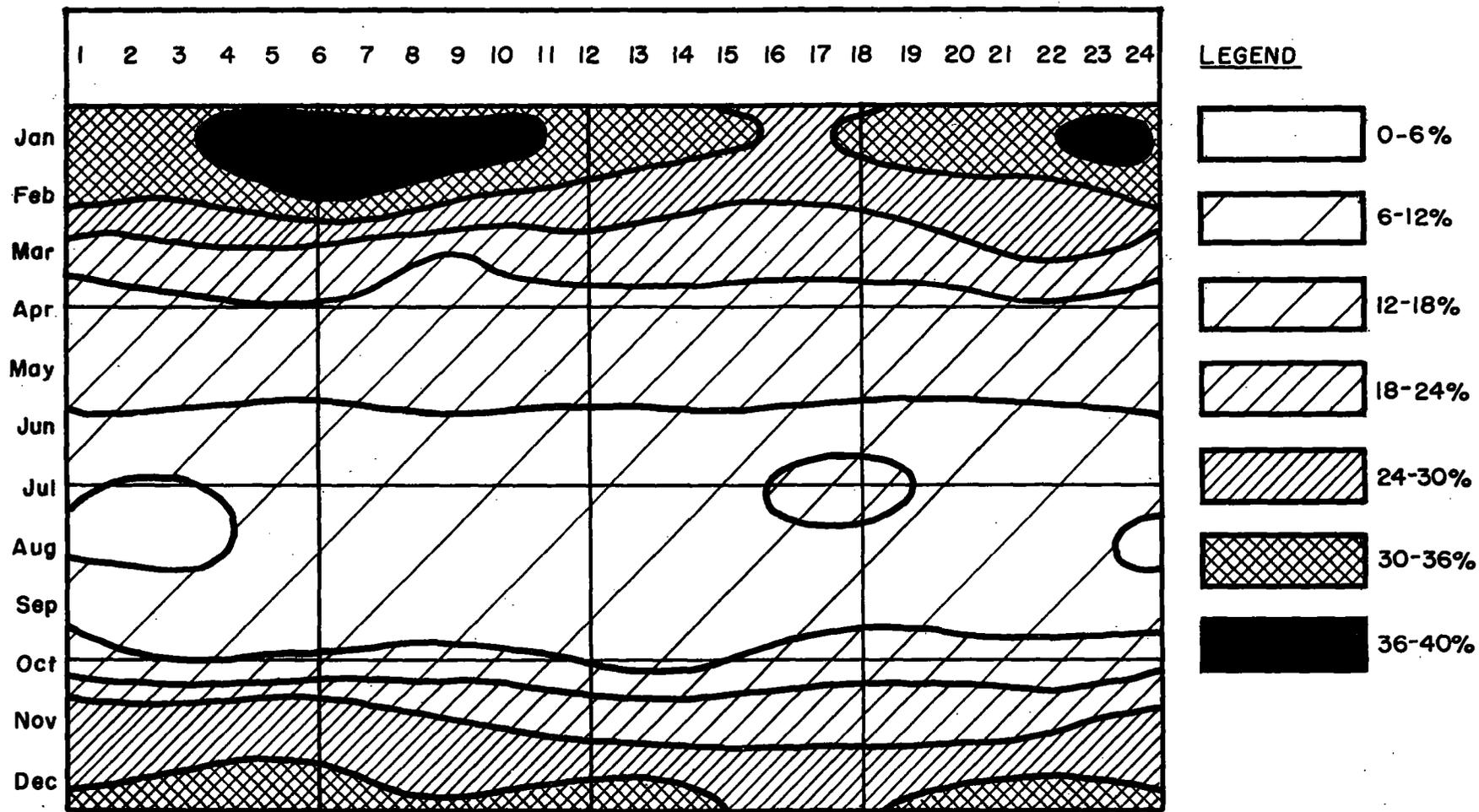
8. Diurnal variation of thunderstorms - This chart shows a very decisive maximum at 1700 hours in July with a percentage frequency of 15%. This is to be compared against a minimum in the same month of 2% at 1000 hours. The late afternoon maximum, although not so pronounced, is found in May, June, August and September.

MKT/ap  
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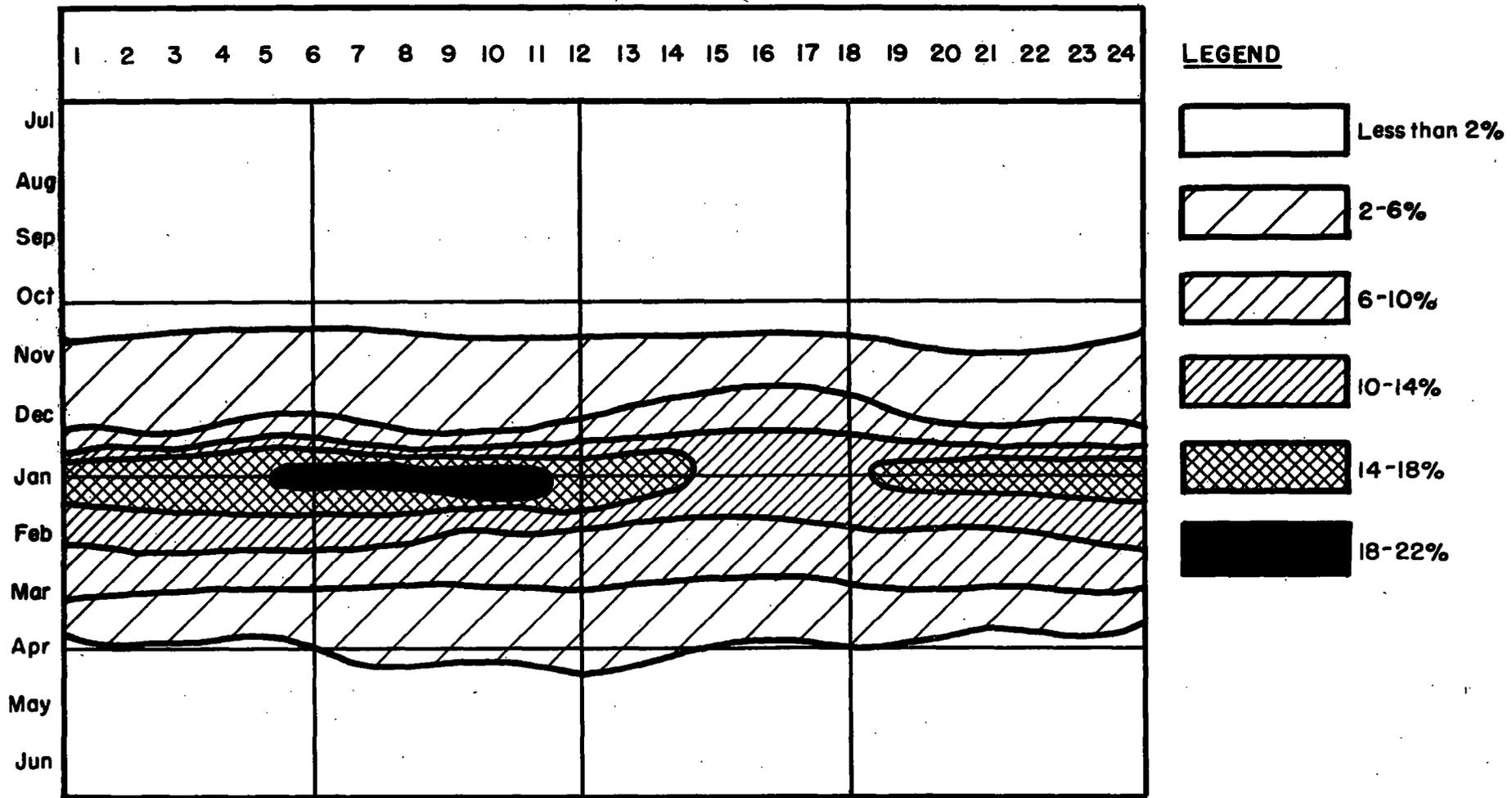


**DIURNAL VARIATION OF MEASURABLE PRECIPITATION  
TORONTO 1941-50**

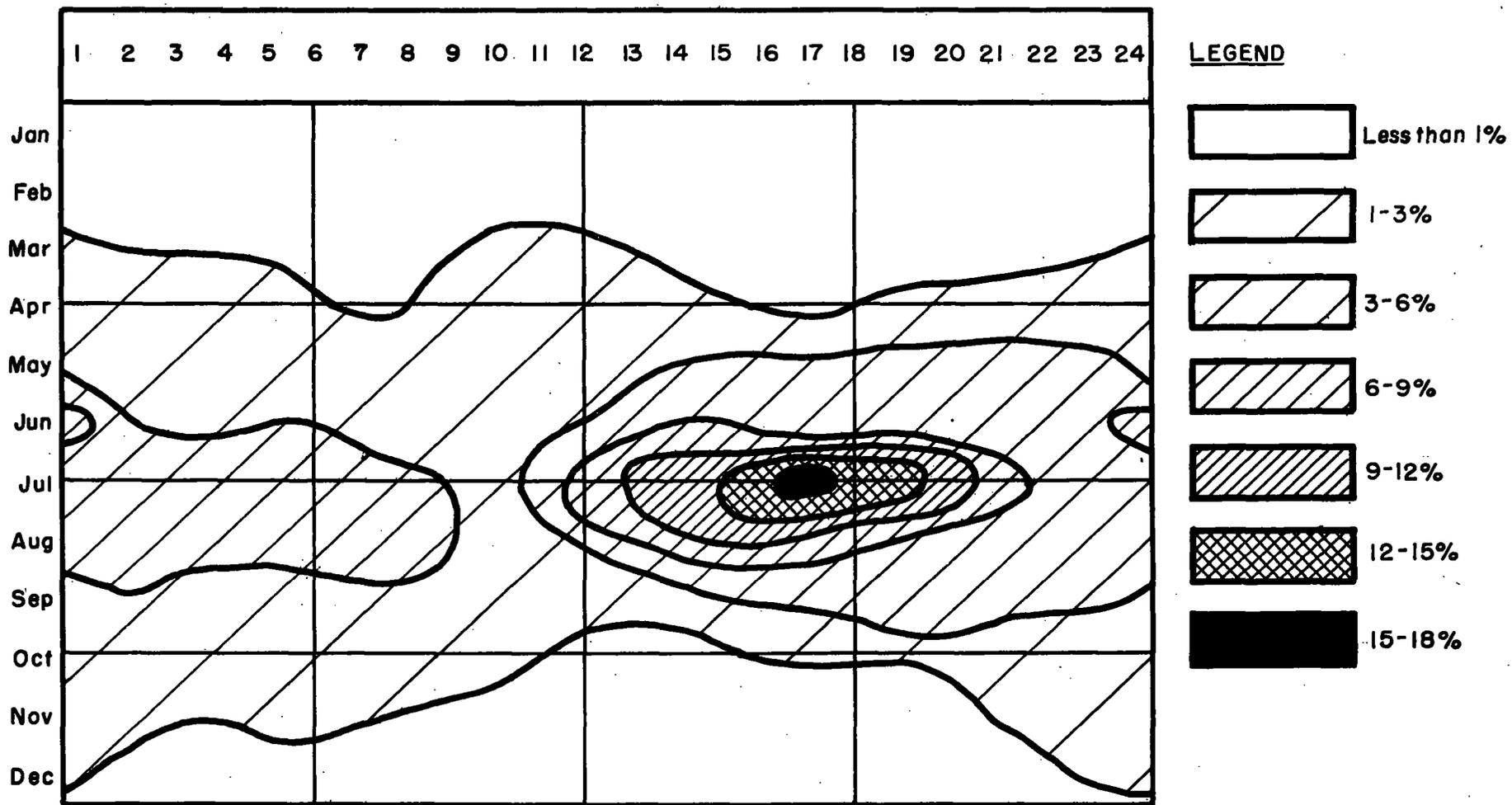


DIURNAL VARIATION OF ALL PRECIPITATION (including traces)

TORONTO 1941-50



DIURNAL VARIATION OF MEASURABLE SNOW  
TORONTO 1941-50



DIURNAL VARIATION OF THUNDERSTORMS  
TORONTO 1941-50